west virginia department of environmental protection

Division of Water and Waste Management
601 57th Street SE
Charleston, WV 25304
Phone Number: (304) 926-0495
Fax Number: (304) 926-0463

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

July 30, 2018

Charles R. Hill
E.I. DuPont de Nemours and Company
P.O. Box 2800
Washington, WV 26181-2800

CERTIFIED MAIL RETURN RECEIPT REQUESTED

Re: WV/NPDES Permit No. WV0001279
Chemours Company – Washington Works

Dear Mr. Hill:

This correspondence is in response to your comment letter dated June 1, 2018 regarding WV/NPDES Water Pollution Control Permit No. WV0001279 for the Chemours' Washington Works facility located in Washington, WV. Comments are summarized, followed by the agency's response.

Comment 1: DuPont requests that Chemours be allowed to accept cooling water and steam condensate via Outlets 102, 405, and 505. DuPont requests monitoring be reduced to 1/month for these outlets.

The permit does not prohibit Chemour's acceptance of non-contact cooling, contact cooling (process wastewater), or steam condensate (process wastewater). The types and number of acceptable wastewaters are detailed in Section C.28. Sections A.102, A.405, A.505 are required in order to measure the process wastewaters (including steam condensate) flow for use in calculation of future 40 CFR 414, OCSPF Effluent Guideline Limitations (ELGs).

The agency has only received aggregate average values for manufacturing area flows in the past and has not been given the opportunity to review the variation in the water usage to determine if less frequent monitoring is appropriate. Also, as stated in the permit's Fact Sheet, there is a significant potential for masking effects due to the large amount of cooling water utilized at the site. Therefore, until the permittee generates a sufficient database of values for review, the agency believes 1/week monitoring is appropriate.

Comment 2: There is an error in the sample location for A.102. It should read "At the discharge from the Filaments Unit (Nylon Fibers) (DuPont)".

The requested revision has been made.

Comment 3: DuPont suggested language for Section C.5

Based on comments from Kuraray, Chemours, and DuPont, Section C.5 has been revised for better clarification.

Comment 4: Section C.25 should be updated to include 40 CFR 414 Subpart F OCPSF production for formaldehyde.

The suggested revision has been made.

Comment 5: Section C.28, and specifically C.28.a.2, should be updated to include the additional facilities listed in the comment letter.

The suggested revisions, where applicable, have been made.

Comment 6: Fact Sheet Section 7.

The suggested revisions, where applicable, have been made.

Comment 7: Metal Bearing waste streams for zinc and Outlet 105.

The change cannot be made. The basis for the flow value of 0.179 MGD was not provided and therefore the agency cannot confirm its applicability to the ELG calculation performed for the draft permit. In general, any flow value provided in an NPDES renewal application for ELG calculations must be adjusted based on the long-term actual average flow as provided in the permittee's Discharge Monitoring Reporting. It is unclear if the flow value has been put in terms of the long-term actual flow. However, based on comments on the draft permit provided by Chemours, the ELGs at Outlet 105 / 005 were re-calculated and have increased.

Comment 8: Request for additional flow to the Chemours wastewater treatment plant.

The additional wastewater flow from the DuPont Zytel® unit cannot be added at this time. Antidegradation rules require the establishment of Baseline Water Quality (BWQ) for all new or expanded discharges and a Tier 2 antidegradation review. Please contact Renee Clevenger of WVDEP to discuss the process to establish BWQ.

Again, the agency would like to thank you for your comments on draft WV/NPDES No. WV0001279. The Division of Water and Waste Management issued WV/NPDES Permit No. WV0001279 on July 30, 2018. Within 30 days of the issuance date of this permit, anyone who may be adversely affected or aggrieved by the permit terms and conditions may file a Notice of Appeal with the Environmental Quality Board, 601 57th Street SE, Charleston, West Virginia 25304. Telephone (304) 926-0445. Thank you for your interest in this application.

Sincerely,

Scott G. Mandirola
Director

SGM:jvl

cc: Env. Inspector Supervisor
EPA Region III
The Chemours Company

E. I. du Pont de Nemours and Company
Washington Works
Mail: P.O. Box 2800
Washington, WV 26181-2800

June 1, 2018

CERTIFIED MAIL – 7017 0190 0000 2942 1177
RETURN RECEIPT REQUESTED

Director, Division of Water and Waste Management, DEP
ATTN: Lori Devereux, Permitting Section
601 57th Street SE
Charleston, WV 25304-2345

RE: Comments to Draft NPDES Permit #WV0001279

Dear Ms. Devereux:

As a tenant of The Chemours Company FC, LLC (Chemours) at the Washington Works, WV facility E. I. du Pont de Nemours & Company (DuPont) appreciates this opportunity to provide comments on draft NPDES permit number WV0001279. Our comments are detailed below:

Page 59 – A. 102 Discharge Limitations and Monitoring Requirements:

This page of the draft permit shows conflicting information and does not represent historically approved discharges. A parenthetical in the first sentence at the top of the page appears to limit discharges at this outlet to "Process Water," but at the foot of the page is a statement seemingly acknowledging that this internal outlet also carries steam condensate. In fact, the flows through this new internal outlet include process water, cooling water and steam condensate, and have for many years. Further, there is no practicable way to segregate the combined flows at this location, therefore, the permit should acknowledge and authorize the discharge of process water, cooling water and steam condensate. DuPont requests that the permittee, Chemours, be authorized to also accept cooling water and steam condensate to be discharged from outlet 102.

In addition, the draft permit calls for estimating the flow at outlet 102 on a weekly basis for the initial 12 months. Historically, DuPont has provided an average estimated flow of process, non-contact cooling and steam condensate water to Outlet 002 from each manufacturing area on a monthly frequency to Chemours[1]. Estimates are based on measured water flow to the process for the month and a detailed evaluation of relative water usage rates performed in 2015. Water usage and discharge from the process does not vary significantly on a day to day or week to week basis. Therefore, DuPont does not believe that a proposed weekly flow monitoring frequency at outlet 102 is justified. If the agency's objective is to collect long-term average flow for future permitting actions, the current monthly monitoring is sufficient to supply this information without additional

[1] In accordance with Condition 5 of WVDEP's response to Chemours on July 2, 2015 in which DEP granted permission for acceptance of offsite wastewater (which included the wastewater from DuPont).

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burden on site resources to perform the required calculations on a weekly basis. Therefore, DuPont requests the flow monitoring requirement be reduced to 1/month.

After the initial 12 months period during which flow would be estimated, the draft permit requires flow to be measured for process water and steam condensate only. Paragraph B.1 on page 70 of the draft permit provides that if the installation of instrumentation to measure the process wastewater and steam condensate cannot be accomplished efficiently, then the permittee may instead develop a sound methodology to estimate these flows based on measured parameters at the individual unit operations. Because the costs or responsibility for complying with this condition may fall to DuPont, it wishes to make clear now that due to the complexity of the piping system, there is no technically feasible means to separate out non-contact cooling water and to measure process water and steam condensate only without using the existing engineering calculation.

Finally, the draft permit provides that the sample is to be taken at the discharge from the Zytel® Unit (Nylon Fibers) (DuPont). This should be corrected to read, "At the discharge from the Filaments Unit (Nylon Fibers) (DuPont)". Filaments, not Zytel®, is the process unit in which nylon fibers are manufactured.

Page 67 – A. 405 Discharge Limitations and Monitoring Requirements:

This page of the draft permit shows conflicting information and does not represent historically approved discharges. A parenthetical in the first sentence at the top of the page appears to limit discharges at this outlet to "Process Water," but at the foot of the page is a statement seemingly acknowledging that this internal outlet also carries steam condensate. In fact, the flows through this new internal outlet include process water, cooling water and steam condensate, and have for many years. Further, there is no practicable way to segregate the combined flows at this location, therefore, the permit should acknowledge and authorize the discharge of process water, cooling water and steam condensate. DuPont requests that the permittee, Chemours, be authorized to also accept cooling water and steam condensate to be discharged from outlet 405.

In addition, the draft permit calls for estimating the flow at outlet 405 on a weekly basis for the initial 12 months. Historically, DuPont has provided an average estimated flow of process, non-contact cooling and steam condensate water to Outlet 005 from each manufacturing area on a monthly frequency to Chemours.[2] Estimates are based on measured water flow to the process for the month and a detailed evaluation of relative water usage rates performed in 2015. Water usage and discharge from the process does not vary significantly on a day to day or week to week basis. Therefore, DuPont does not believe that a proposed weekly flow monitoring frequency at outlet 405 is justified. If the agency's objective is to collect long-term average flow for future permitting actions, the current monthly monitoring is sufficient to supply this information without additional burden on site resources to perform the required calculations on a weekly basis. Therefore, DuPont requests the flow monitoring requirement be reduced to 1/month.

[2] See FN1.

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After the initial 12 months period during which flow would be estimated, the draft permit requires flow to be measured for process water and steam condensate only. Paragraph B.1 on page 70 of the draft permit provides that if the installation of instrumentation to measure the process wastewater and steam condensate cannot be accomplished efficiently, then the permittee may instead develop a sound methodology to estimate these flows based on measured parameters at the individual unit operations. Because the costs or responsibility for complying with this condition may fall to DuPont, it wishes to make clear now that due to the complexity of the piping system, there is no technically feasible means to separate out non-contact cooling water and to measure process water and steam condensate only without using the existing engineering calculation.

Page 68 – A. 505 Discharge Limitations and Monitoring Requirements:

This page of the draft permit does not represent historically approved discharges. A parenthetical in the first sentence at the top of the page appears to limit discharges at this outlet to "Process Water", but flows through this new internal outlet include process water and cooling water and have for many years. Further, there is no practicable way to segregate the combined flows at this location, therefore, the permit should acknowledge and authorize the discharge of process water and cooling water. DuPont requests that the permittee, Chemours, be authorized to also accept cooling water to be discharged from outlet 505.

In addition, the draft permit calls for estimating the flow at outlet 505 on a weekly basis for the initial 12 months. Historically, DuPont has provided an average estimated flow of process, non-contact cooling and steam condensate water to Outlet 005 from each manufacturing area on a monthly frequency to Chemours[3]. Estimates are based on measured water flow to the process for the month and a detailed evaluation of relative water usage rates performed in 2015. Water usage and discharge from the process does not vary significantly on a day to day or week to week basis. Therefore, DuPont does not believe that a proposed weekly flow monitoring frequency at outlet 505 is justified. If the agency's objective is to collect long-term average flow for future permitting actions, the current monthly monitoring is sufficient to supply this information without additional burden on site resources to perform the required calculations on a weekly basis. Therefore, DuPont requests the flow monitoring requirement be reduced to 1/month.

After the initial 12 months period during which flow would be estimated, the draft permit requires flow to be measured for process water only. Paragraph B.1 on page 70 of the permit provides that if the installation of instrumentation to measure the process wastewater cannot be accomplished efficiently, then the permittee may instead develop a sound methodology to estimate these flows based on measured parameters at the individual unit operations. Because the costs or responsibility for complying with this condition may fall to DuPont, it wishes to make clear now that due to the complexity of the piping system, there is no technically feasible means to separate out non-contact cooling water and to measure process water only without using the existing engineering calculation.

[3] See FN1.

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Page 72 – Section C.5.

DuPont would like clarification that it is included as part of the Chemours operated facility as a tenant and include ownership of Little Hocking Service Center.

Suggested language:

Without prior approval from the agency, the permittee shall not accept and treat wastewater from any other non-Chemours owned or operated facility. Chemours may continue to accept wastewater from on-site tenants (including DuPont), the DuPont-owned Little Hocking Service Center, and Chemours' Dry Run Landfill.

Page 77 – Section C.25.

This section should be updated to include 40 CFR 414 Subpart F OCPSF products for formaldehyde production in the Delrin® production unit. This subpart was previously referenced in DuPont's prior NPDES permit and was not carried over into the current draft permit issued to Chemours. The references in the current permit as it relates to DuPont should be reflective of not only current operating conditions but also historic DuPont discharges. As such, this section should read as follows:

This draft permit only authorizes the discharge of process wastewater via Outlets(s) 002 and 005 from the manufacture of 40 CFR 414 Subpart C, D, E, and F OCPSF products.

Page 80 – Section C.28.

This section needs to be updated to include permission for the permittee to accept and treat wastewater from the facilities listed below:

Facility Name	Outlet	SIC Code, Category
E. I. du Pont de Nemours and Company - Delrin® (Polyacetal Resins)	405	28214 & 2869, 40 CFR 414
E. I. du Pont de Nemours and Company - Specialty Compounding Unit	505	28213, 40 CFR 414
E. I. du Pont de Nemours and Company - Filaments Unit (Nylon Fibers)	102	28241, 40 CFR 414
E. I. du Pont de Nemours and Company - Zytel® Unit (Nylon Resins)		28213, 40 CFR 414

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E. I. du Pont de Nemours and Company
- Eng. Polymer Compounding – East

28213, 40 CFR 414

E. I. du Pont de Nemours and Company
- Technical Labs

E. I. du Pont de Nemours and Company
- DuPont Site Operations

Page 80 – Section C.28.a.2.

As noted above in response to Section C.25, DuPont requests that the language in Section C.28.a.2 of the draft permit be reflective of current operating conditions and historic DuPont discharges. Nothing has changed from an operational standpoint but some of the references in this paragraph are incorrectly identified. Please see suggested language below to clarify DuPont operations. Please note the bold and italicized words differ from that of the draft permit and other proposed revisions are noted as strikethroughs.

The wastewater approved for acceptance from ***DuPont*** consists of sanitary sewage, process waste water, non-contact cooling water, steam condensate, and storm water runoff from the manufacturing of Specialty Compounding, Filaments ***(Nylon Fibers)***, Zytel® (Nylon ***Resins***), Delrin® (Polyacetal Resins), ***and Polymer Compounding – East*** products and additional ~~non-process~~ miscellaneous wastewater from DuPont's ~~Polymer Compounding – East,~~ Technical Labs and Site Operations. The subject wastewater (40 CFR 414 ***Subpart C***) shall be monitored per the requirements in Section A.102, ~~A.405 and A.505~~ ***and subject wastewater (40 CFR 414 Subparts D, E, F)*** shall be monitored per the requirements in Sections A.405, and A.505 at a location prior to acceptance. *De minimis* amounts of other process wastewater, non-contact cooling water, and storm water may be accepted contingent upon compliance with Section C.28.a.1.

Page 1 – Fact Sheet Section 7

DuPont no longer owns the Washington, WV facility. Therefore, this section should be updated to reflect current ownership and operations.

Effective July 1, 2015, The Chemours Company FC, LLC assumed ownership and operations at the polymer manufacturing facility at Washington, WV. E. I. du Pont de Nemours and Company and Kuraray operate as tenants at the Chemours-owned facility.

In addition, please include a reference to SIC Code 28214, Subpart E and SIC Code 2869, Subpart F in the parenthetical following polyacetal resins and formaldehyde because these references are those for DuPont's Delrin® operations.

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40 CFR 414 Subparts D, E ,F ,I , J – Outlet 005 – WV0001279

The draft permit appears to suggest DEP is proposing limits based on long term average flow rate at outlet 105. If so, DuPont proposes that the limits for metal bearing waste flow for zinc be calculated using the following basis.

Based on historical long term average flow data, the DuPont metal bearing waste stream (Zn) at outlet 105 represents 12.09% of the total outlet flow. Therefore, the total zinc limits imposed at 105 should be based on 12.09% of the total flow value used in the outlet 105 limit calculations (1.48 mgd) as follows:

0.179 mgd * 1.05 mg/l * 8.34 = 1.57 lbs. Avg. Monthly

0.179 mgd * 2.61 mg/l * 8.34 = 3.90 lbs. Max. Daily

Please note the numbers provided above are only based on DuPont's zinc bearing waste stream to 105, and would not include any potential Chemours contributions.

Request for Additional Flow to Chemours Wastewater Treatment Plant

To respond to unanticipated rapidly increasing global demand for its polymer and grow its business presence and jobs in the US, Zytel® (Nylon Resins) is planning to convert two of its existing claves to the production of High Temperature Nylon (HTN) resins (SIC code 2821). This fast track project will likewise require rapid permit approval so that construction can begin as early as late 2018 to allow HTN production to be brought on line in late 2019 and reach full capacity likely by the end of June 2020. Given the needed expedited timeline of the project, the very modest changes in the nature and quantity of the anticipated wastewaters and the fortuitous timing of the permit renewal comment period, we are submitting additional information as part of our comments so that WVDEP can consider and approve this project as part of the renewed permit rather than needing to resort to cumbersome and time-consuming Administrative Order procedures or future permit modifications. The nylon resins that these claves currently produce will be shifted to other existing claves, so there will be a modest increase in the average Zytel® production wastewater flow of 5300 gallons per day to the on-site Chemours Washington Works wastewater treatment plant prior to its treated discharge through the Chemours NPDES outfall 105. The HTN production wastewaters will be substantially similar to the wastewaters produced by the existing Nylon Resin production except for the presence of two compounds which were not included in the previously submitted Chemours site's permit application: 3 methyl piperidone or 3MP (CASRN 626-56-2) and 2-methyl-1,5-Pentanediamine or 2 MPMD (CASRN 15520-10-2). SDS are attached for the two new compounds. Based on the available literature and on the experience gained from the commercialization of HTN production elsewhere, we believe that these compounds will be substantially biodegraded in the Chemours site wastewater treatment plant and will not otherwise adversely affect permit compliance. DuPont is undertaking studies as required by Chemours to assure compatibility with the HTN discharges with their wastewater treatment system and to assure

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continued compliance with the NPDES permit conditions that govern its treated discharge. We are requesting that this additional wastewater flow and load be included in the calculations for the effluent limitations for outfalls 105 and 005 so that our business plans can be realized with the issuance of the renewed permit.

Should you have any questions pertaining to these comments or need additional information, please contact Charles Hill at (304)863-2202 or Phil Smith at (304)863-2896.

Sincerely,

Charles R. Hill
DuPont SHE Manager

CRH: pts/kdf
Enclosures

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Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	Flammable material, avoid heat and sources of ignition. Irritating to skin, eyes, and the respiratory system	

Section I. Chemical Product and Company Identification

Chemical Name 3-Methylpiperidine

Catalog Number	P0444
Synonym	3-Pipecoline
Chemical Formula	$CH_3C_5H_{10}N$
CAS Number	626-56-2

Supplier: TCI America
9211 N. Harborgate St.
Portland OR
1-800-423-8616

In case of Emergency Call Chemtrec®
(800) 424-9300 (U.S.)
(703) 527-3887 (International)

Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
3-Methylpiperidine	626-56-2	Not available.	Not available.	Not available.

Section III. Hazards Identification

Acute Health Effects
Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Chronic Health Effects
CARCINOGENIC EFFECTS : Not available.
MUTAGENIC EFFECTS : Not available.
TERATOGENIC EFFECTS : Not available.
Toxicity to the reproductive system: Not available.
There is no known effect from chronic exposure to this product. **Repeated or prolonged exposure to this compound is not known to aggravate existing medical conditions.**

Section IV. First Aid Measures

Eye Contact
Check for and remove any contact lenses. DO NOT use an eye ointment. Flush eyes with running water for a minimum of 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical attention. Treat symptomatically and supportively.

Skin Contact
If the chemical gets spilled on a clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical touches the victim's exposed skin, such as the hands: Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. Seek medical attention. Treat symptomatically and supportively. Wash any contaminated clothing before reusing.

Inhalation
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform artificial respiration. Seek medical attention. Treat symptomatically and supportively.

Ingestion
Remove dentures if any. Watch for an obstruction in the victim's mouth. Remove if possible what is causing the obstruction but do not force fingers or a hard object between the victim's teeth. Have conscious person drink several glasses of water or milk. INDUCE VOMITING by sticking finger in throat. Seek immediate medical attention and, if possible, show the chemical label. Treat symptomatically and supportively.

Section V. Fire and Explosion Data

Flammability	Flammable.	Auto-Ignition	Not available.
Flash Points	17°C (62.6°F)	Flammable Limits	Not available.

Combustion Products
These products are toxic carbon oxides (CO, CO_2), nitrogen oxides (NO_x).

Fire Hazards
Reactive with strong oxidizers. Vapors may travel to source of ignition and flash back. Closed containers may explode from the heat of a fire. Highly flammable in presence of open flames and sparks, of heat.

Explosion Hazards
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.
No additional information is available regarding the risks of explosion.

Continued on Next Page Emergency phone number (800) 424-9300

Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemicals, CO_2, alcohol foam or water spray. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion. Consult with local fire authorities before attempting large scale fire-fighting operations.

Section VI. Accidental Release Measures

Spill Cleanup Instructions	Flammable liquid. Irritating material. Keep away from heat and sources of ignition. Mechanical exhaust required. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. DO NOT touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition.

Section VII. Handling and Storage

Handling and Storage Information	IRRITANT. FLAMMABLE. Reactive with strong oxidizers; may be ignited by heat, sparks, or flames. Vapors may travel to source of ignition and flash back. Closed containers may explode from heat of a fire. Empty containers may pose a fire risk. Evaporate residue under a fume hood if possible. Ground all equipment containing material. Keep away from heat and sources of ignition. Mechanical exhaust required. Avoid excessive heat and light. DO NOT ingest. Do not breathe gas, fumes, vapor or spray. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Avoid contact with skin and eyes. Always store away from incompatible compounds such as oxidizing agents, acids.

Section VIII. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash station and safety shower is proximal to the work-station location.
Personal Protection	Splash goggles. Lab coat. Vapor respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. 
Exposure Limits	Not available.

Section IX. Physical and Chemical Properties

Physical state @ 20°C	Liquid.	Solubility	Not available.
Specific Gravity	0.85		
Molecular Weight	99.18	Partition Coefficient	Not available.
Boiling Point	126°C (258.8°F)	Vapor Pressure	Not available.
Melting Point	Not available.	Vapor Density	Not available.
Refractive Index	Not available.	Volatility	Not available.
Critical Temperature	Not available.	Odor	Not available.
Viscosity	Not available.	Taste	Not available.

Section X. Stability and Reactivity Data

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid heat and light.
Incompatibilities	Reactive with strong oxidizing agents, acids.

Section XI. Toxicological Information

RTECS Number	Not available.
Routes of Exposure	Eye contact. Ingestion. Inhalation. Skin contact.
Toxicity Data	Not available.
Chronic Toxic Effects	CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Not available. Toxicity to the reproductive system: Not available. There is no known effect from chronic exposure to this product. Repeated or prolonged exposure to this compound is not known to aggravate existing medical conditions.
Acute Toxic Effects	Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Continued on Next Page

Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	Not available.

Section XIII. Disposal Considerations

Waste Disposal	Recycle to process, if possible. Consult your local or regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state, and local regulations when disposing of this substance.

Section XIV. Transport Information

DOT Classification	**DOT CLASS 3: Flammable liquid.**
PIN Number	**UN1993**
Proper Shipping Name	**Flammable liquids n.o.s.**
Packing Group (PG)	**II**
DOT Pictograms	

Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This product is ON the EPA Toxic Substances Control Act (TSCA) inventory.
WHMIS Classification (Canada)	**WHMIS CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).** **WHMIS CLASS D-2B: Material causing other toxic effects (TOXIC).**
EINECS Number (EEC)	210-953-6
EEC Risk Statements	**R12- Extremely flammable.** **R36/38- Irritating to eyes and skin.**
Japanese Regulatory Data	Not available.

Section XVI. Other Information

Version 1.0
Validated on 7/15/2011.
Printed 7/15/2011.

Notice to Reader

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, household, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.

SAFETY DATA SHEET

1. Identification

Product identifier	**DYTEK® A amine**
Other means of identification	
SDS number	1851
Synonyms	1,5-PENTANEDIAMINE, 2-METHYL
Recommended use	Chemical intermediate.
Recommended restrictions	None known.

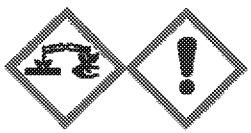
Manufacturer/Importer/Supplier/Distributor information

Manufacturer	
Company information	INVISTA S.à r.l. INVISTA Building 4123 East 37th Street North Wichita, KS 67220
Emergency telephone	1-855-224-6545
General information	Product Information: 1-877-446-8478 Outside the U.S.: +1-770-792-4221
e-mail	msds@invista.com

2. Hazard(s) identification

Physical hazards	Flammable liquids	Category 4
Health **hazards**	Acute toxicity, oral	Category 4
	Acute toxicity, dermal	Category 4
	Acute toxicity, inhalation	Category 4
	Skin corrosion/irritation	Category 1A
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 3
OSHA defined hazards	Not classified.	

Label elements



Signal word	Danger
Hazard statement	Combustible liquid. Harmful if swallowed. Harmful in contact with skin. Harmful if inhaled. Causes severe skin burns and eye damage. May cause respiratory irritation. Harmful to aquatic life.
Precautionary statement	
Prevention	Keep away from flames and hot surfaces-No smoking. Do not breathe mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Avoid release to the environment.
Response	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse.

Storage	Store in a well-ventilated place. Keep container tightly closed. Keep cool. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	None.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
2-METHYL-1,5-PENTAMETHYLENEDIAMINE		15520-10-2	> 98.5

4. First-aid measures

Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If breathing is difficult, give oxygen. If the affected person is not breathing, apply artificial respiration. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Do not use mouth-to-mouth method if victim inhaled the substance. Get medical attention immediately.
Skin contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Thoroughly wash (or discard) clothing and shoes before reuse. Get medical attention immediately.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.
Ingestion	If swallowed, do NOT induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Never give anything by mouth to a victim who is unconscious or is having convulsions. Do not use mouth-to-mouth method if victim ingested the substance. Get medical attention immediately.
Most important symptoms/effects, acute and delayed	Inhalation: Harmful if inhaled. Inhalation of vapors/fumes may cause respiratory irritation with throat discomfort, coughing or difficulty breathing. Inhaled corrosive substances can lead to a toxic edema of the lungs. Skin: Causes severe skin burns. Symptoms may include redness, edema, drying, defatting and cracking of the skin. Harmful in contact with skin. Eyes: Causes serious eye damage. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva. Permanent eye damage including blindness could result. Ingestion: Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract. Harmful if swallowed. Ingestion can cause gastrointestinal irritation, nausea, vomiting and diarrhea.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Call a physician if symptoms develop or persist.

5. Fire-fighting measures

Suitable extinguishing media	Dry chemical, CO2, water spray or regular foam.
Unsuitable extinguishing media	Do not use a solid water stream as it may scatter and spread fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed. Decomposition of this product may emit oxides of nitrogen and carbon monoxide. Combustible. Vapors may travel considerable distance to a source of ignition and flash back.
Special protective equipment and precautions for firefighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Structural firefighters protective clothing will only provide limited protection.
Fire fighting equipment/instructions	In the event of fire, cool tanks with water spray. In the event of fire and/or explosion do not breathe fumes. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Move containers from fire area if you can do so without risk. Use standard firefighting procedures and consider the hazards of other involved materials.

Specific methods	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Water runoff can cause environmental damage. ALWAYS stay away from tanks engulfed in flame.
General fire hazards	Irritating and toxic gases or fumes may be released during a fire. Fire and explosion hazards are moderate when this product is exposed to heat or flame.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep people away from and upwind of spill/leak. Immediately evacuate personnel to safe areas. Keep out of low areas. Remove all sources of ignition. For personal protection, see section 8 of the SDS. Do not touch or walk through spilled material.
Methods and materials for containment and cleaning up	Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Eliminate all sources of ignition or flammables that may come into contact with a spill of this material. Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean contaminated surface thoroughly. Never return spills in original containers for re-use.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. Avoid release to the environment.

7. Handling and storage

Precautions for safe handling	Avoid contact with skin and eyes. Do not breathe mist/vapor/spray. Keep container closed. Use care in handling/storage. Use only outdoors or in a well-ventilated area. Observe good industrial hygiene practices. Wear appropriate personal protective equipment. When using, do not eat, drink or smoke. Do not taste or swallow. Wash hands after handling and before eating. Avoid release to the environment.
Conditions for safe storage, including any incompatibilities	Avoid contact with skin and eyes. Do not breathe dust/fume/gas/mist/vapors/spray. Keep tightly closed in a dry, cool and well-ventilated place. Keep this material away from food, drink and animal feed. Keep away from heat, sparks, and flame. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits	No exposure limits noted for ingredient(s).
Biological limit values	No biological exposure limits noted for the ingredient(s).
Exposure guidelines	No exposure standards allocated.
Appropriate engineering controls	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels. Attempts should be made to eliminate all contact with skin and eyes, and to limit inhalation exposure.

Individual protection measures, such as personal protective equipment

Eye/face protection	Avoid contact with eyes. Wear chemical goggles and face shield.
Skin protection	
Hand protection	Avoid contact with skin. Wear appropriate chemical resistant gloves. Request information on glove permeation properties from the glove supplier.
Other	Where contact is likely, wear chemical-resistant gloves, a chemical suit, rubber boots, and chemical safety goggles plus a face shield.
Respiratory protection	Use a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. When using, do not eat, drink or smoke. Keep away from food and drink. Avoid contact with the skin and the eyes. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Appearance	
Physical state	Liquid.
Form	Liquid.
Color	Colorless.
Odor	Ammoniacal.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	-76 - -68.8 °F (-60 - -56 °C)
Initial boiling point and boiling range	377.6 °F (192 °C)
Flash point	181.4 °F (83 °C) Tag Closed Cup
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	0.22 mm Hg at 20°C
Vapor density	Not available.
Relative density (liquid)	Not available.
Solubility(ies)	
Solubility (water)	Completely miscible
Partition coefficient (n-octanol/water)	< 1
Auto-ignition temperature	662 °F (350 °C) at 1020.3-1025.5 hPa
Decomposition temperature	Not available.
Viscosity	3 mPa·s at 22.6°C
Other information	Combustible liquid.
Density	0.86 g/cm3 at 25°C

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Stable under recommended storage conditions. Risk of ignition.
Possibility of hazardous reactions	Not expected to occur.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources.
Incompatible materials	Incompatible with strong acids and oxidizing agents.
Hazardous decomposition products	Irritating and/or toxic fumes and gases may be emitted upon the product's decomposition. Decomposition of this product may emit oxides of nitrogen and carbon monoxide.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Harmful if inhaled. Inhalation of vapors/fumes may cause respiratory irritation with throat discomfort, coughing or difficulty breathing. Inhaled corrosive substances can lead to a toxic oedema of the lungs.
Skin contact	Causes severe skin burns. Symptoms may include redness, edema, drying, defatting and cracking of the skin. Harmful in contact with skin.

Eye contact	Causes serious eye damage. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva. Permanent eye damage including blindness could result.
Ingestion	Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract.
Symptoms related to the physical, chemical and toxicological characteristics	See information on likely routes of exposure.

Information on toxicological effects

Acute toxicity Harmful by inhalation, in contact with skin and if swallowed.

Product	Species	Test Results
DYTEK® A amine		
Acute		
Dermal		
LD50	Rabbit	1870 mg/kg
Inhalation		
Mist		
LC50	Rat	4.9 mg/l/1h
Oral		
LD50	Rat	1170 mg/kg

Skin corrosion/irritation	Causes severe skin burns.
Serious eye damage/eye irritation	Corrosive to the eyes and may cause severe damage including blindness.
Respiratory or skin sensitization	
Respiratory sensitization	Due to lack of data the classification is not possible.
Skin sensitization	Based on available data, the classification criteria are not met.
Germ cell mutagenicity	Did not show mutagenic effects in animal experiments.
Carcinogenicity	Based on available data, the classification criteria are not met.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity	Based on available data, the classification criteria are not met.
Specific target organ toxicity - single exposure	Respiratory tract irritation.
Specific target organ toxicity - repeated exposure	Based on available data, the classification criteria are not met.
Aspiration hazard	Due to lack of data the classification is not possible.
Chronic effects	Based on available data, the classification criteria are not met.

12. Ecological information

Ecotoxicity Harmful to aquatic organisms.

Product		Species	Test Results
DYTEK® A amine			
Aquatic			
Algae	EC50	Algae	> 100 mg/l, 72 Hours
Crustacea	EC50	Daphnia	19.8 mg/l, 48 Hours
Fish		Fish	1825 mg/l

Persistence and degradability	Readily biodegradable.
Bioaccumulative potential	No data available for this product.

Partition coefficient n-octanol / water (log Kow)

< 1

Mobility in soil	No data available.
Other adverse effects	None known.

13. Disposal considerations

Disposal instructions	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Dispose of contents/container (in accordance with related regulations).

14. Transport information

DOT

UN number	UN2735
UN proper shipping name	Amines, liquid, corrosive, n.o.s (2-METHYLPENTAMETHYLENEDIAMINE)
Transport hazard class(es)	8
Subsidiary class(es)	Not applicable.
Packing group	I
Marine pollutant	No

IATA

UN number	UN2735
UN proper shipping name	Amines, liquid, corrosive, n.o.s. (2-METHYLPENTAMETHYLENEDIAMINE)
Transport hazard class(es)	8
Subsidiary class(es)	Not applicable.
Packaging group	I
Environmental hazards	No
ERG Code	8L

IMDG

UN number	UN2735
UN proper shipping name	AMINES, LIQUID, CORROSIVE, N.O.S. (2-METHYLPENTAMETHYLENEDIAMINE)
Transport hazard class(es)	8
Subsidiary class(es)	Not applicable.
Packaging group	I
Marine pollutant	No
EmS	F-E, S-B

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not available.

DOT

IATA; IMDG

15. Regulatory information

US federal regulations	All components are on the U.S. EPA TSCA Inventory List or are not required to be listed on the inventory.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	**Immediate Hazard - Yes** **Delayed Hazard - No** **Fire Hazard - Yes** **Pressure Hazard - No** **Reactivity Hazard - No**

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical	Yes

SARA 313 (TRI reporting)

Not regulated.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	September-06-2013
Revision date	May-19-2016
Version #	1.2
HMIS® ratings	Health: 3* Flammability: 2 Physical hazard: 0
NFPA ratings	Health: 3 Flammability: 2 Instability: 0
List of abbreviations	IARC = International Agency for Research on Cancer. ACGIH = American Conference of Governmental Industrial Hygienists. OSHA = Occupational Safety and Health Administration. NTP = National Toxicology Program. CAS = Chemical Abstract Service TWA = Time Weighted Average SDS = Safety Data Sheet TLV = Threshold Limit Value. NFPA = National Fire Protection Association. HMIS = Hazardous Material Information System.
References	Internal assessments, testing and research. Thompson Micromedex, Database, 2006. Hazardous Substance Data Bank, Database, 2006.

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Revision information

Product and Company Identification: Product and Company Identification
Transport Information: Material Transportation Information